Annals of Clinical and Analytical Medicine
Original Research

The effect of endometrioma cystectomy on dysmenorrhea and noncyclic pelvic pain

VAS and endometrioma cystectomy

Zercan Kalı[1], Fatma Tanılır Çagıran[2]
[1] Department of Gynecology and Obstetrics, Private Gözde Academy Hospital, Malatya
[2] Department of Gynecology and Obstetrics, Private Genesis Hospital, Diyarbakır, Turkey

Abstract
Aim: In this study, we aimed to evaluate the effect of endometrioma cystectomy on dysmenorrhea and noncyclic pelvic pain with a linear visual analog scale (VAS).
Material and Methods: Sixteen patients who were admitted with the diagnosis of symptomatic endometrioma and planned for endometrioma cystectomy were included in the study. Ten patients for whom cystectomy was decided due to non-endometriotic benign ovarian cysts were included in the control group. Pre- and postoperative VAS scores were recorded in the control group. Before the operation and in the first and third months of the postoperative period, patients with dysmenorrhea and noncyclic pelvic pain were asked to mark the perceived pain intensity on a 100 mm horizontal line. The area they marked was measured from the left edge with a ruler divided into 1 mm units and VAS scores were recorded.
Results: VAS values recorded to determine the severity of dysmenorrhea before endometrioma cystectomy decreased significantly in the first and third-month scorings after cystectomy. Similarly, VAS values recorded to evaluate noncyclic pelvic pain intensity before cystectomy decreased significantly in the first and third postoperative months. A more significant decrease was found in the VAS values recorded in the third month for both dysmenorrhea and noncyclic pelvic pain compared to the first month. Uni- or bilateral endometrioma did not significantly affect the decrease in VAS values. There were non-significant decreases in preoperative and postoperative VAS scores of the patients in the control group. There was no significant difference between the mean pain reductions for dysmenorrhea and noncyclic pelvic pain.
Discussion: Endometrioma cystectomy leads to a significant decrease in dysmenorrhea and noncyclic pelvic pain VAS scores. The decrease in VAS values becomes more evident as the postoperative period is prolonged.

Keywords
Endometrioma, Cystectomy, VAS, Pelvic Pain

DOI: 10.4328/ACAM.21600 Received: 2023-01-17 Accepted: 2023-04-29 Published Online: 2023-05-08 Printed: 2023-07-01 Ann Clin Anal Med 2023;14(7):586-589
Corresponding Author: Zercan Kalı, Department of Gynecology and Obstetrics, Private Gözde Akademi Hospital, Malatya, Turkey.
E-mail: zercankali@gmail.com P: +90 530 223 96 30
Corresponding Author ORCID ID: https://orcid.org/0000-0002-7128-7550
This study was approved by the Ethics Committee of Diyarbakır Gazi Yaşargil Education and Research Hospital (Date: 2022-12-30, No: 280)

Introduction

Endometriosis is defined as the placement of the endometrial gland and stroma outside the uterine cavity. Foci are mostly located in the pelvic peritoneum and adjacent organs. However, endometriotic foci can be located anywhere in the body and in distant organs. Endometrioma is one of the most common complications of endometriosis (15-45%) and is a fluid/blood-filled cystic formation in the ovaries. It is the most common cause of secondary dysmenorrhea in women of reproductive age and adolescents. Endometriosis/endometrioma is found in approximately two-thirds of women who undergo laparoscopy for chronic pelvic pain or dysmenorrhea. Endometriosis-induced CPP and dysmenorrhea do not fully respond to normal analgesics and oral contraceptives [1].

The formation of CPP and dysmenorrhea seen in endometrioma depends on the combined effect of many factors. Active endometriotic foci located in the peritoneum or adjacent pelvic organs cause both bleeding and inflammatory changes, as they contain estrogen receptors [2]. Iron in the blood in the foci causes oxidative stress and stimulates the synthesis of inflammatory molecules and prostaglandins [3]. Increasing prostaglandins stimulate the neurovascular tissues around the foci and trigger pain. Hemorrhages on the peritoneal surfaces potentiate the pain by compressing the adjacent nerve tissues. Chronic cyclic focal hemorrhages cause fibrosis in the peritoneum, causing tension and pain in the nerve fibers. An increase in angiogenesis and neural growth factor synthesis disrupts the innervation of the uterus, fallopian tubes, and ovaries, leading to chronic pain [4]. In clinical practice, endometrioma patients exhibit many different pain spectrums. In addition to dysmenorrhea and dyspareunia, many different forms of pain such as abdominal discomfort, low back pain, and heavy menstrual bleeding may occur [5]. Oral contraceptives and progesterone therapy are primarily used in medical treatment. For palliative purposes, nonsteroidal anti-inflammatory drugs can be tried [3]. GnRHa is the last-line drugs to be used for medical purposes. Endometrioma surgery may be required in cases that do not respond to medical treatment.

If the pain due to endometrioma does not decrease despite 6 months of medical treatment, surgery may be attempted. A 50% reduction in pain has been reported after endometrioma cystectomy [6,7]. The Linear visual analog scale (VAS) scoring is used in the objective evaluation of endometrioma-related dysmenorrhea and CPP. VAS is a form of measurement that correlates with acute pelvic pain. The VAS score consists of a non-graded 100 mm line ranging from zero pain to severe pain. The VAS score is measured with the help of a ruler with a 1 mm measuring interval [8,9]. This study was planned to compare VAS scores measured in the pre-and postoperative period in patients who underwent laparoscopic endometrioma cystectomy with the diagnosis of symptomatic endometrioma (subfertility, CPP, dysmenorrhea, etc.). VAS scores measured before surgery and in the first and third months after surgery were compared.

Material and Methods

Sixteen patients who were admitted with the diagnosis of symptomatic endometrioma and planned for endometrioma cystectomy were included in the study. Participants were selected from patients aged 20-35 years who applied to Gözde Akademi Hospital's Gynaecology outpatient clinic with subfertility, pelvic pain, or dysmenorrhea and were subjected to endometriosis research. The diagnosis of endometrioma was made by gynecological examination and transvaginal ultrasonographic examination, taking into account the patient's complaints. Transvaginal ultrasound has high diagnostic accuracy in the diagnosis of endometrioma. Endometrioma was diagnosed in the presence of unilocular ground glass-like cyst fluid in the USG examination. Pain during the examination was accepted as a finding supporting the diagnosis [10]. MR imaging was used in patients whose definitive diagnosis could not be made. In addition, serum CA-125 levels were also measured. Other causes of secondary dysmenorrhea other than endometrioma were investigated. Definitive diagnosis was made by visual examination during laparoscopy and pathological diagnosis of cyst material. Patients with high BMI values (>30 kg/m2), PCOS patients, those who had previous ovarian or pelvic surgery, and those who used hormonal therapy in the last 3 to 6 months were not included.

Ten patients for whom cystectomy was decided due to non-endometriotic benign ovarian cysts were considered as the control group. The cyst was removed using a four-port laparoscopy technique under general anesthesia. The content was aspirated from an incision made on the cyst and the cyst wall was removed with forceps. Bipolar cautery was used to control bleeding. Superficial peritoneal endometriotic foci were excised. Before the operation and in the first and third months of the postoperative period, patients with dysmenorrhea and noncyclic pelvic pain were asked to mark the perceived pain intensity on a 100 mm horizontal line. The area they marked was measured from the left edge with a ruler divided into 1 mm units and VAS scores were recorded. Pre- and postoperative VAS scores were recorded in the control group. Ethical approval for our study was obtained from Diyarbakır Gazi Yaşargil Education and Research Hospital on 30.12.2022 with protocol number 280.

Statistical analysis

Statistical Package for Social Sciences version 21.0 (SPSS, Chicago, IL, USA) was used for the analysis of all collected data. Whether the data were normally distributed was tested with Kolmogorov-Smirnov. Normally distributed data were analyzed with Student's t-test, and abnormally distributed data were analyzed with the Mann-Whitney U test. The results were presented as mean+ SD, $p<0.05$ was accepted as statistically significant.

Ethical Approval

Ethics Committee approval for the study was obtained.

Results

The comparison of the preoperative and first and third postoperative month VAS scores of the patients in the endometrioma and control group is presented in Table 1. The cysts of all patients in the endometrioma and control groups were successfully removed. In the endometrioma group, foci located in the peritoneum and ligaments were also excised. No serious complication was detected during the surgical treatment

of both groups. There was a significant decrease in CA125 values measured in the postoperative third month compared to preoperative values (41.4±5.22 IU/mL vs 27.3±7.40 IU/mL, p<0.01).

VAS values recorded to determine the severity of dysmenorrhea before endometrioma cystectomy decreased significantly in the first and third-month scorings after cystectomy. Similarly, VAS values recorded to evaluate noncyclic pelvic pain intensity before cystectomy decreased significantly in the first and third postoperative months. A more significant decrease was found in the VAS values recorded in the third month for both dysmenorrhea and noncyclic pelvic pain compared to the first month. Uni- or bilateral endometrioma did not significantly affect the decrease in VAS values. There were non-significant decreases in preoperative and postoperative VAS scores of the patients in the control group. There was no significant difference between the mean pain reductions for dysmenorrhea and noncyclic pelvic pain.

Table 1. VAS score of patients with endometrioma and non-endometriotic ovarian cysts before and after surgery.

Dysmenorrhea VAS, mm	Ovarian Endometrioma	Non-endometriotic benign ovarian cyst	p-values
	N=16	N=10	
Before surgery	81.4±11.6	22.4±6.09	<.002
After surgery (First month)	34.3±6.44	7.47±3.01	0.03
After surgery (3rd month)	22.4±3.50	3.56.±2.01	<.001
Mean Reduction	43.6±4.09/54.1±10.2	11.6±7.30/18.3±8.66	0.01
Non-cyclic pelvic pain VAS, mm			
Before surgery	47.8±4.76	22.7±9.40	0.01
After surgery (First month)	9,60±7.40	4.54±2.77	<.001
After surgery (3rd month)	4.60±1.22	3.14±1.01	<.001
Mean Reduction	35.70±8.22/41.9±7.10	17.4±2.40/19.5±3.05	0.02

Discussion

Endometriosis occurs when endometrial tissue becomes functional by being implanted in any tissue under the influence of estrogen. The presence of a multifactorial etiology leads to the continuation of the problems related to its treatment. The main hormone that allows endometrial tissue to attach to the peritoneum and other organs is estrogen. During peritoneal involvement, pain due to bleeding and inflammation occurs. Although the aging of the foci reduces its activation in the chronic process, the picture of pain due to fibrosis and compression of the nerve fibers continues. Endometrioma is actually a serious ovarian complication of endometriosis [11,12]. It occurs after the interaction of foci in the peritoneum and ovarian surface epithelium. Endometriomas cause many different pain conditions such as subfertility, chronic pelvic pain, dysmenorrhea, and dyspareunia. In patients who do not respond to medical therapy, removal of foci and endometrioma may be required to reduce pain. However, surgery is not a definitive solution for pain. Since recurrence will be seen in most cases, the pain will start again [13].

Pain due to endometriosis shows individual differences. According to the pain threshold, patients describe pain is quite different ways. We analyzed the pre-and post-operative pain perception severity of patients who decided to have laparoscopic cystectomy due to the diagnosis of symptomatic endometrioma, using the VAS score. Some of these patients are the group of patients who apply with the complaint of infertility but also have concurrent pain. Some of them are patients who have difficulties in reaching the egg before IVF/ICSI. In summary, they are patients who have been given a surgical decision for more than one complaint. The fact that pain is subjective is the biggest difficulty in pain assessment. The VAS score is a non-objective scale used to evaluate different types of pain. When we looked at the VAS scores before and after endometrioma surgery, we found a significant decrease in the VAS score one month after the surgery. VAS scores three months after surgery were lower. The prolongation of the postoperative period led to a significant reduction in the pain felt. The decrease in the VAS score, which was determined as 81 and measured for dysmenorrhea in the preoperative period, to 34 in the first month and 22 in the third month, is an important evidence that endometrioma surgery reduces the severity of pain. Similarly, while the preoperative VAS score was 47 in the evaluation of noncyclic pelvic pain, it decreased to 9 in the first month and to 4 in the third month. Endometrioma cystectomy resulted in a reduction in CPP in addition to dysmenorrhea. Compared with the non-endometriotic cyst group, it was observed that the pain felt both preoperatively and post-operatively decreased more significantly in the endometrioma group. The pain felt by the patients in the control group may have been perceived as milder because it was mostly due to the compression effect of the cyst. In addition, the absence of intraperitoneal bleeding and inflammation in the control group may explain the difference in VAS scores between the groups.

The interpretation of the decrease in VAS scores after endometrioma cystectomy is quite complex. While some authors consider the VAS score to be a linear score, others consider it a ratio or ordinal [14]. We are closer to the group that accepts the VAS score as linear. The reduction in pain due to a decrease in the VAS score from 81 to 34 is two times less than the decrease from 81 to 22. This means a decrease of 60 in the late postoperative period versus a 50 percent decrease in the early postoperative period. The lower the VAS value, the more effective the surgical procedure.

Conclusion

As a result, the decision of surgery related to endometrioma pain should be left to the last stage. First, medical treatments should be tried, hormonal suppression should be done, and if no response is obtained, surgery should be started. Accompanying subfertility or adversely affecting daily performance strengthens the surgical option. Despite the limited number of cases, our study has clinical importance in terms of showing that endometrioma surgery significantly reduces VAS scores. It is obvious that there is a need for more comprehensive studies in which different scoring systems are used in combination.

Scientific Responsibility Statement
The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement
All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

Funding: *None*

Conflict of interest
None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.

References
1. Doyle JO, Missmer SA, Laufer MR. The effect of combined surgical medical intervention on the progression of endometriosis in an adolescent and young adult population. J Pediatr Adolesc Gynecol. 2009; 22(4):257-63.
2. Leyland N, Casper R, Laberge P, Singh SS, SOGC. Endometriosis: Diagnosis and Management. J Obstet Gynaecol Can. 2010; 32(7):1-32.
3. Vercellini P, Vigano P, Somigliana E, Fedele L. Endometriosis: pathogenesis and treatment. Nat Rev Endocrinol. 2014; 10(5):261-75.
4. Stratton P, Berkley KJ. Chronic pelvic pain and endometriosis: translational evidence of the relationship and implications. Hum Reprod Update. 2011; 17(3):327-46.
5. Uludag SZ, Demirtas E, Sahin Y, Aygen EM. Dienogest reduces endometrioma volume and endometriosis-related pain symptoms. J Obstet Gynaecol. 2021; 41(8):1246-51.
6. Alkatout I, Mettler L, Beteta C, Hedderich J, Jonat W, Schollmeyer T, et al. Combined surgical and hormone therapy for endometriosis is the most effective treatment: prospective, randomized, controlled trial. J Minim Invasive Gynecol. 2013; 20(4): 473-81.
7. Sachedina A, Todd N. Dysmenorrhea, Endometriosis and Chronic Pelvic Pain in Adolescents. J Clin Res Pediatr Endocrinol. 2020; 12(1):7-17.
8. Khechen B, Haws BE, Patel DV, Cardinal KL, Guntin JA, Singh K. Does Gender Influence Postoperative Outcomes in Minimally Invasive Transforaminal Lumbar Interbody Fusion? Clin Spine Surg. 2019; 32(2): 107-11.
9. Chen YJ, Wang PH, Ocampo EJ, Twu NF, Yen MS, Chao KC. Single-port compared with conventional laparoscopic-assisted vaginal hysterectomy: a randomized controlled trial. Obstet Gynecol 2011; 117(4): 906-12.
10. Ambildhuke K, Pajai S, Chimegave A, Mundhada R, Kabra P. A Review of Tubal Factors Affecting Fertility and its Management. Cureus. 2022; 14(11):30990.
11. Johnson NP, Hummelshoj L. Consensus on current management of endometriosis. Hum Reprod 2013; 28(6):1552-68.
12. Kitajima M, Khan KN, Harada A, Taniguchi K, Inoue T, Kaneuchi M, et al. Association between ovarian endometrioma and ovarian reserve. Front Biosci (Elite Ed). 2018; 10(1):92-102.
13. Kanellopoulos D, Karagianni D, Pergialiotis V, Nikiteas N, Lazaris AC, Iliopoulos D. Endometriosis and Subfertility: A Literature Review. Maedica (Bucur). 2022; 17(2):458-63.
14. Kheil MH, Sharara FI, Ayoubi JM, Rahman S, Moawad G. Endometrioma and assisted reproductive technology: a review. J Assist Reprod Genet. 2022; 39(2):283-90.

How to cite this article:
Zercan Kalı, Fatma Tanılır Çagıran. *The effect of endometrioma cystectomy on dysmenorrhea and noncyclic pelvic pain. Ann Clin Anal Med 2023;14(7):586-589*

This study was approved by the Ethics Committee of Diyarbakır Gazi Yaşargil Education and Research Hospital (Date: 2022-12-30, No: 280)